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The role of Teaching Factory (TEFA) Management on Entrepreneurship Skill of Vocational School Students: A Structural Equation Modelling Analysis

By

Edy Siswanto
Universitas Negeri Semarang, Indonesia

Samsudi
Universitas Negeri Semarang, Indonesia

Eko Supraptono
Universitas Negeri Semarang, Indonesia

Yeri Sutopo
Universitas Negeri Semarang, Indonesia

Abstract

This study aims to determine the factual model (prototype) of Teaching Factory (TEFA) management which is oriented towards entrepreneurial skills of students in Vocational High Schools (SMK). TEFA is a way of learning for students to provide direct work experience through a learning process that collaborates with the industrial world so that it will improve entrepreneurial skills and industrial culture, through a governance system. This study uses a quantitative approach, namely an approach that emphasizes analysis on numerical data that is processed by statistical methods. Quantitative research is a type of research that produces findings that can be achieved (obtained) using statistical procedures or other means of quantification (measurement) this research is an associative research, namely research that aims to determine the relationship or influence between two or more variables. The unit of analysis in this study was 240 teachers and 360 students of vocational school in Central java. The determination of the number of samples used in this study was based on the Slovin method as a measuring tool to calculate sample size because the known population was more than 100 respondents. The sampling technique used is simple random sampling, Data Analysis Techniques Data analysis techniques in this study using Partial Least Square (PLS). PLS is a Structural Equation Modeling (SEM) equation model with an approach based on variance or component-based structural equation modeling? The results of this study found that teaching factory management has a significant effect on Entrepreneurship Skill. The application of the teaching factory learning model in Vocational High Schools is effective in increasing the entrepreneurial character of vocational school students. This can be proven through the results of research conducted by several previous researchers which showed an increase in various aspects of entrepreneurial character, including achievement motivation, future orientation, leadership in entrepreneurship, business networks, and have a responsive and creative attitude as well as the effectiveness of the teaching factory learning model in improving the entrepreneurial character of innovative vocational school students in facing changes after the teaching factory learning model is applied

Keywords: Teaching Factory; Management; Entrepreneurship Skill; Vocational Shool Students; Structural Equation Modelling Analisys; TEFA

Introduction

According to Dhani et al. (2021) one approach to implementing learning in vocational schools that has been implemented in recent years is the Teaching Factory (Tefa). This approach aims to provide direct work experience to students through a collaborative learning process with the business/industry world. The management of the implementation of TEFA in Vocational High Schools is really expected not only to develop technical skills (technical skills) but also entrepreneurial skills (soft skills) of graduates, including teamwork, leadership, customer service, negotiation, and the like. According to Wahjusaputri et al. (2022) Management of Tefa is actually the application of POAC (planning, organizing, actuating, and controlling) to four components, namely: learning materials/materials, learning methods/strategies, human resources (vocational teachers and managers), and time/duration of activities in implementing Tefa. Based on an initial survey of several Tefa Vocational Schools, the application of POAC to the four components has not been optimal, especially the impact on the development of graduate entrepreneurial skills and industrial culture.

According to Setyaningsih et al. (2022); Setiawan et al. (2022) the impact that is expected to be obtained by students is the development of entrepreneurial skills and industrial culture, through the governance applied in Tefa. However, until now, the implementation of Tefa has not had an optimal impact on students' entrepreneurial skills and industrial culture. The product/finding produced in this study is the Tefa management model in SMK which is oriented towards developing students' entrepreneurial skills, which can be applied by SMK. The model found includes components: design of Tefa learning materials/materials, strategy/method of implementing Tefa, criteria for HR (vocational teachers and managers) of Tefa, and time/duration of activities in implementing Tefa. In the implementation of Tefa learning there are key activities that need to be emphasized, namely; Product Based Education, Block Scheduling, Job-sheet application and Corporate Culture Enforcement (ATMI, 2018).

According to Dwijayanthi et al. (2022); Karyana et al. (2021) The Tefa program provides opportunities in overcoming various quality problems for SMK graduates. Collaboration and synergy are needed with school stakeholders in order to run optimally and achieve goals. The approach is student entrepreneurship. With the existence of Tefa, SMK can produce products that are not just a work. However, the resulting product can provide benefits to the community and can be distributed to the community and industry.Not all Vocational Schools have implemented integrated Tefa according to standards and are oriented towards entrepreneurial skills using modern management principles. Implementation in the field of cooperation with Industry is limited to signing a MoU or a memorandum of understanding for cooperation.

According to Mourtzis et al. (2021); Pratiwi et al. (2022) the learning approach of the Tefa model oriented to student entrepreneurship skills can provide added value to entrepreneurial skills, which is strongly encouraged by the government, in forming prospective young entrepreneurs. Producing quality products, both goods and services to improve learning and life skills. The management model of the Tefa management model oriented to student entrepreneurship skills can optimize the production unit (UP) in schools with the support of the school's collaboration with IDUKA in order to produce industrial-standard goods and services. According to Mourtzis et al. (2021); Mourtzis et al. (2021); Pratiwi et al. (2022) Cooperation between SMK and IDUKA can improve the suitability of the SMK program with the needs of IDUKA. Tefa's management model is oriented towards student entrepreneurship skills, emphasizing the learning management process in a business

and production-oriented practice workshop room based on work procedures and standards at IDUKA starting from planning, organizing, implementing, monitoring and evaluating. The advice that can be given is that the Tefa management model is oriented towards students' entrepreneurial skills, so that they are more active in finding consumers/orders both from within the school itself and from outside the school (general public). in order to further increase the opportunities for learning to work, entrepreneurship, therefore this model can be more focused on emphasizing life skills competencies for work and entrepreneurship. Tefa's management model is oriented towards student entrepreneurship skills, in order to make more use of IT advancements in digital promotion and marketing efforts, according to the demands of the 4.0 industrial revolution era and 5.0 society era. Tefa's management model is oriented towards student entrepreneurship skills, in order to further develop creative knowledge and skills to develop product innovations, both goods and services.

Literature Review

Teaching Factory

According to Rohaeni et al. (2021); Setyaningsih et al. (2022) Teaching Factory (Tefa) is a production and business-oriented learning. Learning through Tefa is the process of mastering expertise or skills carried out based on actual work procedures and standards to produce products or services ordered by consumers. The implementation of business in schools is carried out in an integrated manner with learning activities, so that the main goal is not solely to obtain financial benefits, but a combination of financial benefits and learning outcomes. Teaching Factory is a concept that changes the paradigm of vocational education into a new strategy that supports the need for a workforce of graduates who have experience for future industries. According Perwiranegara et al. (2022); Rohaeni et al. (2021) mentioned that the world of work today demands a new approach that integrates industry and learning in schools, and that can be implemented in real terms through the Teaching Factory concept.Tefa is a learning model or approach that harmonizes learning in vocational schools with the concept of work in modern industry, where production equipment and materials used in modern industry are available and used also in the classroom. The learning approach in SMK must continue to be improved or modernized so that it is closer to practical activities in Industry. Diana Nur Azizah et.all3, mentions: (1) Teaching Factory is an industry-based learning model that utilizes production units as a place to run production and business processes; and (2) the teaching factory is developed in an integrated manner with the production unit as a place of practice for vocational students.

According to Rohaeni et al. (2021); Setyaningsih et al. (2022) the teaching factory in terms of learning can run well, there is a commitment from the school to carry it out seriously. Factors that influence success are: 1) professional and competent teachers, 2) adequate facilities, 3). support from good schools.

Entrepreneurship Skills

For SMK graduates, entrepreneurial skills can mean interpersonal skills for the 21st century, which include teamwork, leadership, customer service, negotiation, and the like. Therefore, learning in SMK, including in the implementation of Tefa, needs to be designed to develop entrepreneurial skills. The study of Ball, Joyce and Butcher5 explains that there are two important 21st century skills that need to be assessed, namely: (a) the 21st century life & career skills (21C-LCS); and (b) the 21st century skills classroom environment (21C-SCE). In the 21C-LCS, the aspects measured are: leadership and responsibility, working effectively with others, and adaptability. Important aspects of the measurement relate to 21st century skills, particularly in life skills and career development.

According to Setiawan et al. (2022); Wahjusaputri et al. (2022) Entrepreneurship is always related to creativity and innovation. Innovation is created, because of the high power of creativity. Creativity is the ability to bring something new into life. Creativity is an important source of competitive power, because the environment changes rapidly. Humans must be creative to be able to respond to change.

According to Mourtzis et al. (2021);Pratiwi et al. (2022) concluded that TEFA learning was effective in increasing students' ability to produce and serve consumers, but less effective in increasing the entrepreneurial spirit.Yuyus et al, explain entrepreneurship (entrepreneurship) can be defined as the behavior of individuals who have enthusiasm, the ability to give a positive response to opportunities for self-profit, and better service to customers or society; by always trying to find and serve more and better subscriptions and create and provide more useful products and implement more efficient ways of working. Through the courage to take risks, creativity, and innovation, as well as management skills. Entrepreneurship demands a spirit that never gives up, dares to take risks, and is creative and innovative to be able to win business competition.

According Setiawan et al. (2022);Wahjusaputri et al. (2022)Entrepreneurial character is a character, psychological traits, morals or character that distinguishes one person from another. Character building is the process of carving or sculpting the soul in such a way, so that it is unique, interesting and different or can be distinguished from others. The importance of skills in entrepreneurship, must be the foundation for the intelligence and knowledge (brains and learning) of an entrepreneur. Among the entrepreneurial skills are as follows: dare to start, dare to take risks (not afraid of loss), full of calculation, have a clear plan, not easily satisfied and despair, optimistic and full of confidence, have responsibility, have ethics and morals.

Method

This study uses a quantitative approach, namely an approach that emphasizes analysis on numerical data that is processed by statistical methods. Quantitative research is a type of research that produces findings that can be achieved (obtained) using statistical procedures or other means of quantification (measurement) This research is an associative research, namely research that aims to determine the relationship or influence between two or more variables. The unit of analysis in this study was 240 teachers and 360 students of vocational school in Central java. The determination of the number of samples used in this study was based on the Slovin method as a measuring tool to calculate sample size because the known population was more than 100 respondents. The sampling technique used is simple random sampling, because members of the population have the same opportunity to become members of the sample, not there is discrimination against members of the population.

Data Analysis Techniques Data analysis techniques in this study using Partial Least Square (PLS). PLS is a Structural Equation Modeling (SEM) equation model with an approach based on variance or component-based structural equation modeling. PLS is used to explain whether there is a relationship between latent variables (prediction). PLS is a powerful analytical method because it does not assume current data with a certain scale measurement, the number of samples is small

Convergent Validity of the measurement model with reflexive indicators can be seen from the correlation between item scores/indicators and construct scores. Individual reflective measure is said to be high if it has a correlation of more than 0.70 with the construct to be

measured. However, at the research stage of the scale development stage, a loading of 0.50 to 0.60 is still acceptable. Discriminant Validity Discriminant validity indicators can be seen in the cross loading between the indicators and their constructs. Another method to assess discriminant validity is to compare the square root of the average variance extracted (√AVE) for each construct with the correlation between the construct and other constructs with the model [26]. The model is said to have a fairly good discriminant validity if the AVE root for each construct is greater than the correlation between the constructs and other constructs. The model is said to be good if the AVE of each construct is greater than 0.50. Indirect Effect Test This test was conducted to see the value of the indirect effect between variables. This test is carried out using the bootstrapping method using smartPLS 3.0. Intervening variables are said to be able to mediate the effect of exogenous (independent) variables on endogenous (dependent) variables if the T statistic value is greater than the T table and the P value is smaller than the significant level used (5%)

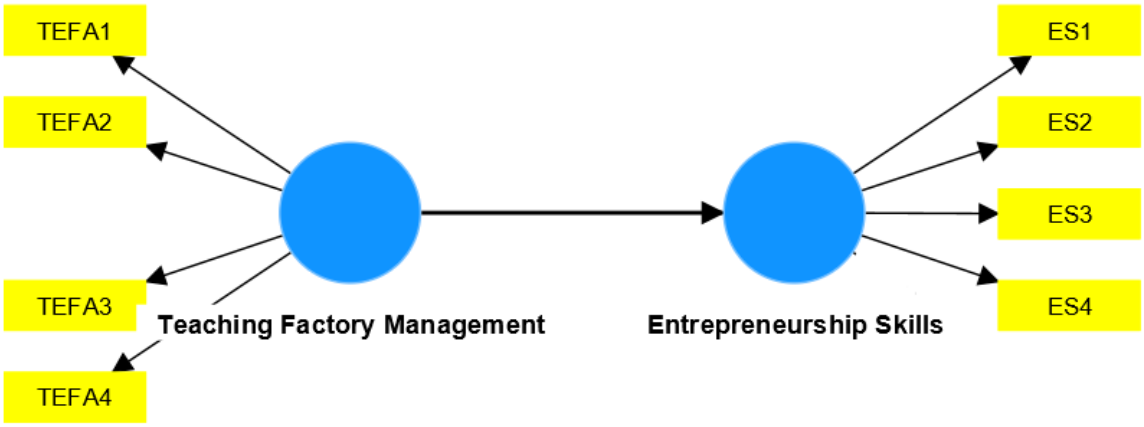

Figure 1. *Research Model*

H1: Teaching Factory Management has a significant effect on entrepreneurship skill

Results and Discussion

Outer Model Evaluation

The measurement model or Outer Model with reflective indicators is evaluated with convergent and discriminant validity of the indicators and composite reliability for indicator blocks Individual reflective measure is said to be high if it has a correlation of more than 0.70 with the construct to be measured. However, for research in the early stages of developing a measurement scale, a loading value of 0.50 to 0.60 is considered sufficient.

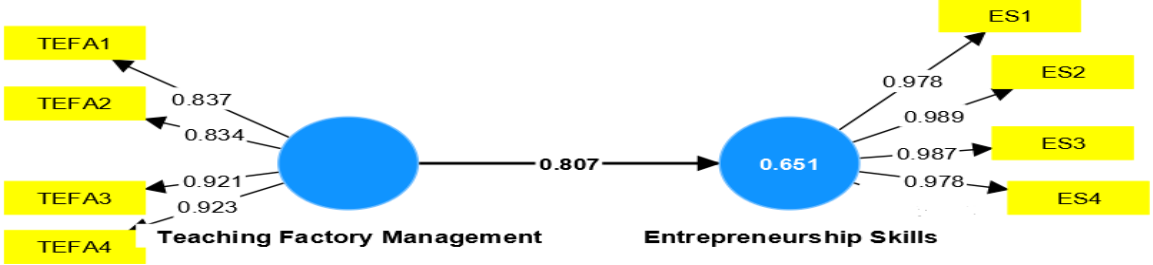

Fig 2. *Convergent Validity*

Based on the measurement model above, all indicators are analysis of research variables with a loading factor greater than 0.50 so that it is declared significant or meets the requirements of convergent validity.

Average Variance Extracted (AVE) and Latent Correlation

Another method to assess discriminatory validity is to compare the value of the square root of average variance extracted (AVE) of each construct with the correlation between constructs and other constructs in the model. If the square root value of AVE for each construct is greater than the correlation value between constructs and other constructs in the model, then it is said to have a good discriminant validity value. The results of the AVE test can be seen in Table 1 below

Table 1. *AVE*

Variables	AVE
Teaching Factory Management	0.859
Entrepreneurship Skill	0744

Based on the AVE value in the table above, all variables have a value > 0.50 so it can be said that each indicator that has been measured has been able to reflect their respective variables validly.

Cronbach's Alpha and Composite Reliability

The next examination of convergent validity is construct reliability by looking at the output of composite reliability or Cronbach's Alpha. The criterion to be said to be reliable is the composite reliability or Cronbach's Alpha value of more than 0.70. Reliability tests were carried out to prove the accuracy, consistency and accuracy of the instrument in measuring constructs. In PLS-SEM using the SmartPLS 3.0 program, to measure the reliability of a construct with reflexive indicators, it can be done in two ways, namely with Cronbach's Alpha and Composite Reliability . The construct is declared reliable if the composite reliability and Cronbach alpha values are above 0.70.

Table 2. *Croanch's Alpha dan Composite Reliabilty*

Variables	Cronchbach's Alpha	Composite Reliability
Teaching Factory Management	0.945	0.987
Entrepreneurship Skill	0.921	0.912

Evaluation of Inner Model and Outer Loading

The inner model is a test by evaluating between latent constructs that have been hypothesized in the study. Bootstrapping is a statistical resampling procedure or technique. Resampling means that respondents are drawn randomly with replacement, from the original sample many times until observations are obtained.

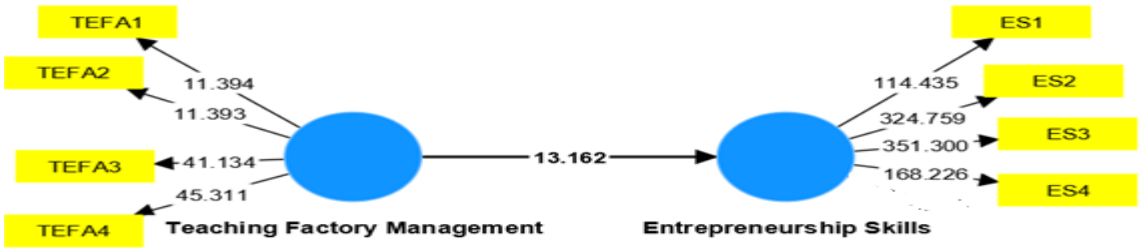

Fig 3. *Inner Model*

Based on the results above, it can also be seen that all paths have met the significant figures at 95% CI > (1.96). This is a requirement in the evaluation with a loading factor, which is carried out to assess the significance of the latent construct with its construct. Testing of the structural model is done by looking at the R-square value which is the goodness-fit test of the model. Changes in the value of R-Square can be used to explain the effect of certain exogenous latent variables on endogenous latent variables whether they have a substantive effect. the R Square values of 0.75, 0.50 and 0.25 can be concluded that the model is strong, moderate and weak. Furthermore, it is seen how much strength the dependent exogenous and endogenous variables are in this initial model by looking at the magnitude of the R Square value for each of the endogenous variables in table 3 below:

Table 3 *R Square*

Dependent Variables	R Square
Entrepreneurship Skill	0.621

Table 3 above explains the contribution of the variables that affect the variables in the R-Square table, the R-Square value of the Entrepreneurship Skill variable is 0.621 or 62.1%, meaning that the teaching factory management variables contribute to the entrepreneurship skill variable by 62.1% and 37.9% is influenced by other factors outside of this study.

Hypothesis Testing

To determine the constancy of the proposed model in a population, look at the value of the relationship between one variable and another variable or the value of the path coefficient (rho) by looking at the value of O (original sample) and the statistical T value or p value as a statement of the value of the significance level of the relationship. between one variable and another (the significance level is taken at the p value or the error level of 5% or is at T above 1.96). Direct Effect Test This test is carried out to see the value of the direct influence between variables. This test is carried out using the bootstrapping method using smartPLS 3.0. Intervening variables are said to be able to mediate the effect of exogenous (independent) variables on endogenous (dependent) variables if the T statistic value is greater than the T table and the P value is smaller than the significant level used (5%)

Table 4. *Hypothesis Testing Direct Relationship*

	P Value	Sig
Teaching Factory Management -> Entrepreneurship Skill	0.000	Supported

Relationship of Teaching Factory Management and Entrepreneurship Skill

Based on the results of data analysis, the p value of 0.000 is smaller than 0.050 so it can be concluded that Teaching Factory Management has a significant effect on Entrepreneurship Skill. An increase in the Teaching Factory Management variable will lead to a significant increase in the Entrepreneurship Skill variable, and a decrease in the leadership variable will encourage a significant decrease in the Entrepreneurship Skill variable. This is in line with the research states that Teaching Factory Management has a significant effect on knowledge management. Forming students who have entrepreneurial character can be realized by growing a great interest in entrepreneurship. Vocational schools see this problem by providing lessons Teaching Factory and Learning models

According to Setyaningsih et al. (2022); Setiawan et al. (2022); Wahjusaputri et al. (2022) Entrepreneurial creative products. From model Teaching Factory is expected that Vocational School students will grow interest entrepreneurship and given the eye

Entrepreneurship creative product lessons students can understand more deeply about company or industry, understand in management and competence obtained during practice Teaching Factory , Interest in entrepreneurship is expected to be grow because students understand that the business is quite profitable and is felt to be able to get money quickly just selling the goods or services they have company or industry. After students get the program production-oriented learning and business (Teaching Factory) learning mastery of expertise or skills carried out according to procedures and real working standards.

According to Dhani et al. (2021)';Dwijayanthi et al. (2022);Karyana et al. (2021);Lestari et al. (2021) Teaching Factory is a learning model that utilizes the basic structure of the school to create an industrial atmosphere in schools in order to increase the ability of productive subjects for students. Even at school, students face actual work based on the abilities that must be possessed, they will still get direct experience in the form of an industrial environment. Thus, the capabilities to be achieved are in accordance with the expected capabilities, and there is no capability gap between industrial demands and the capabilities developed in schools. The Teaching Factory learning model is a combination of existing learning, namely competency-based training (CBT) and production-based learning to create goods/services needed by the market and industry.

In addition, based on research conducted by Maruanaya et al... (2021);Mourtzis et al. (2021);Mourtzis et al. (2021) which describes the results of the research he conducted regarding the implementation of the teaching factory in the learning process, it can run well and improve students' entrepreneurial abilities. Through the teaching factory process, students can produce goods and services that have added value with quality that can be absorbed and accepted by the public. Which is not only present in an entrepreneur, but also in all people who think creatively and behave innovatively, both from among entrepreneurs and the general public. Research conducted by According to Pratiwi et al. (2022); Perwiranegara et al. (2022); Rohaeni et al. (2021) on the development of entrepreneurial character in the fashion creative industry through the implementation of TF-6M where in this research the researcher has applied the teaching factory learning model to development in the control class, while conducting conventional learning models in the experimental class.

Conclusion

The results of this study found that teaching factory management has a significant effect on Entrepreneurship Skill. The application of the teaching factory learning model in Vocational High Schools is effective in increasing the entrepreneurial character of vocational school students. This can be proven through the results of research conducted by several previous researchers which showed an increase in various aspects of entrepreneurial character, including achievement motivation, future orientation, leadership in entrepreneurship, business networks, and have a responsive and creative attitude as well as the effectiveness of the teaching factory learning model in improving the entrepreneurial character of innovative vocational school students in facing changes after the teaching factory learning model is applied

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